MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

ATTACH. K

January 19, 1994

TO: Gene Hall, Project Manager
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FROM: Robert L. Delaney, Jr., Geologist
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SUBJECT: Albion/Sheridan Dispute Resolution, January 10, 1994 Response To MDNR Disputed Items Regarding Albion Sheridan Township Landfill, From Leah Evison to Mary Pat Tyson, Albion/Sheridan Landfill, Calhoun County

I have prepared the following comments to EPA's response to the disputed items concerning the Albion/Sheridan Landfill remedial investigation.

EPA claims that, *"In our opinion, the magnetometer survey results are typical of a mixed municipal/industrial landfill where a variety of scrap metal was disposed and the ground water emanating from the landfill is remarkably clean."* MDNR still believes that drums may have been buried in discreet locations at the site. MDNR geophysicists are addressing the issue. However, it is our opinion that the hydrogeology of the site is significantly more complex than the RI report would lead the reviewer to believe. Our office has documented this fact in several memos which EPA has received. At this point, neither EPA, nor their consultant, have been able to present an analysis of our findings that, in any significant way, can dispute our interpretation. They have provided no written, technical response to our concerns that in anyway modifies our interpretation of the data.

Based upon our interpretation of the data, it is likely that a significant plume of contamination could be moving to the northwest, away from the site. This movement, if it exists, has gone undetected because virtually all the plume tracking wells were placed to the southwest of the landfill. None were placed along the potential track of a plume moving to the northwest.

I will address this issue in the following section.

<u>MDNR Proposal: Additional Monitoring Well Nests at Proposed Locations #1, 2, 3 and 4, with Vertical Sampling</u>

<u>Locations #2 and #3</u>

"Although we see no evidence of it (see for example the EM34 geophysical survey results), we agree it is a possibility that low level contaminants (below MCLs) may move north-west from the area of low flow gradients to the south west of the landfill." This statement is somewhat confusing. The EM34 data does not extend to the north even as far as MW3. Bifurcation of a plume between MW4 and MW3, if the EM survey is accurate in showing the direction of the plume, may have been revealed by the EM survey had the survey covered the area to the north as far as MW3.

Interestingly, specific conductance (which the EM survey is theoretically, qualitatively measuring), at MW 3 (unconsolidated and in the weathered bedrock) were higher than, or comparable to, specific conductance levels recorded in MW 4. Unconsolidated aquifer specific conductance levels at MW 3 were among the highest found anywhere on the site. The consultant showed a direct connection between the plume at MW 3 and MW 4 on their maps and cross sections. However, when one looks at the EM34 data north of MW4 there are lower EM readings north of MW4. If the contamination at MW 3 and MW 4 are connected, and theoretically, higher conductivity water is closer to the surface north of MW 4, than the EM data should not show decreasing levels but rather increasing levels as MW 3 is approached.

There are some significant technical issues to be resolved. Is the EM actually working as well as EPA assumes at this site? Where does the contamination at MW3 flow to? Is MW3 on the margins of a plume that flows to the northwest. Is there a point of contact between the plume at MW3 and MW4, or are they two separate plumes? Does the EM34 quadrature phase maps (20m vertical) 5 and 6 mmhos/m, that begin to curve toward the northwest on the northern boundary of the survey, indicate the effects of a plume moving away from the area around MW3 and south of MW3? The same trend is apparent with the 4 mmhos/m contour on the "20m horizontal" map. If anything the EM data is suggestive of a more complex problem to the north.

Additionally, how does EPA know that the contamination is *"low level (below MCLs)?"* These assumptions must be confirmed by field verification of data.

Finally, locations #2 and #3 were picked by the MDNR in response to the RI presentation of ground water flow and the apparent component of groundwater flow to the south west. EPA's discussion of the potential flow to the northwest is therefor confusing as to how it relates to locations #2 and #3.

Location #4

"After discussion with the MDNR, we now agree to also include one additional bedrock well to the west of the landfill, if it is located between existing monitoring wells MW08 and MW03, rather than MDNR's location #4. (We do not believe that location #4 is in the flow path from the Albion Landfill)." Again, where does contamination at MW3 flow to? Is MW3 on the margins of a contaminant plume flowing to the northwest. MDNR is willing to discuss the location of #4, but EPA will need to provide a technical rationale for their choice of location. Otherwise, the location would appear to be arbitrary.

MDNR recommends vertical sampling of the aquifer. Unless EPA is able to confidently indicate which 5 foot interval in the aquifer will have the highest levels of contaminants of concern, vertical aquifer sampling (VAS) is the only cost effective, technically sound method available for properly positioning the well screen. Without VAS, MDNR expects EPA to provide a well reasoned, technical argument to justify their proposed sampling interval. If EPA is unable to do this, or they believe that they will find no contamination at this location, then vertical aquifer sampling is the only technically sound, reasonably priced alternative for the siting of the well screen.

EPA contends that Arsenic is reliably found at depth. This assumes that the aquifer/plume configuration is the same to the northwest as it is in the

southwest. Yet MDNR has already shown that the hydrogeology of the site is much more complex than the simple model EPA has used to make their decisions. It would be wisest to allow the data to show what is happening in the aquifer and not be limited by a working hypothesis. Vertical aquifer sampling is the standard investigative practice in Michigan for sound technical reasons.

Lastly, EPA has not provided any technical written response to our findings. They have only said that they disagree. We are more then willing to consider sound, technical arguments that would prove that our understanding of the aquifer and potential plume movement is incorrect.

cc: Jim Heinzman, ERD